

## Density Practice Problems Pre-AP

The following problems deal primarily with the concept of density but also cover metric conversion. You will need to complete the problems on a separate sheet of paper showing all work. Work includes labeling what information you are provided with and using dimensional analysis to determine the answer which you will circle. Look at the example below to help guide you.

*If a diamond has a weight of 5.9g and the density( $\rho$ ) of the pure diamond is 3.52g/cm<sup>3</sup>.*

**M = 5.9g       $\rho = 3.52\text{g/cm}^3$       V = ?**

$$5.9\text{g} \times \frac{1\text{ cm}^3}{3.52\text{g}} = \textcircled{1.68\text{cm}^3}$$

1. If M = 45g and V = 15ml, what is  $\rho$  in g/ml?
2. If M = 330.5g and V = 56.8cm<sup>3</sup>, what is  $\rho$  in g/L?
3. Given the formula of density as  $\rho = \frac{m}{v}$ , what would it look like solved for
  - a. mass?
  - b. volume ?
4. If M = 20g and V = 10ml, what is  $\rho$  in g/L?
5. A student measures the mass of an 8cm<sup>3</sup> block of brown sugar to be 12.9 g. What is the density ( $\rho$ ) of the brown sugar?
6. A machine shop worker records the mass of an aluminum cube as 176 g. If one side of the cube measures 4cm (Vol<sub>cube</sub> = s<sup>3</sup>), what is the density of the aluminum?
7. An ice berg has a volume of 12km<sup>3</sup>, and a mass of 1.1x10<sup>16</sup>kg. What is the density of the ice in g/cm<sup>3</sup>?
8. Gold is one of the densest substances on Earth. A gold bar 20cm x 5cm x 5cm has a mass of 9.7 kg. What is the density of gold? Express your answer in g/cm<sup>3</sup>.
9. What volume would a 0.871gram sample of air occupy if the density of air is 1.29 g/L?

10. A cup of sugar has a volume of 237ml. What is the mass of the cup of sugar if the density is 1.59 g/ml?

11. You decide you want to carry a boulder home from the forest. It has a volume of 27 000 cm<sup>3</sup>. It is made of granite, which has a typical density of 2.8 g/cm<sup>3</sup>. What is the mass of the boulder? What is the mass in kg?

12. Which has the greater mass, 1 L of water or 1 L of gasoline? The density of water is 1.00 g/ml and that of gasoline is approximately 0.68 g/ml.

13. While serving a sentence in prison, Lil Wayne's grill was stole out of his mouth while he was sleeping. The grill was dropped into a graduated cylinder with 25ml of water in it. If the volume rose to 75ml and the density of platinum is 21.45g/cm<sup>3</sup>, what is the mass of his grill?

14. A crumpet recipe calls for 175 grams of flour. According to Julia Child's data, the density of flour is 0.620 g/ml. How many ml of flour are needed for this recipe?

15. Mercury is a liquid metal used in older thermometers and thermostats, which has a density of 13.6 g/ml. What is the volume of 200.g of mercury metal?

16. Many modern smart phones (except the iPhone) use a special glass called Gorilla Glass which can be up to 6x more scratch and shatter resistant then regular glass screens. If the density of Gorilla Glass is 2.44g/cm<sup>3</sup> and the screen on a Galaxy sIII is 12cm x 6.1cm x 0.45cm, what is the mass of the screen in grams? (Volume = L x W x H)

2) 5.82g/L	4) 2E <sup>3</sup> g/L	6) 2.75g/cm <sup>3</sup>	8) 19.4g/cm <sup>3</sup>	10) 376.83g	12) water	14) 282.3mL	16) 80.4g
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